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(56) Documents Cited
GB 2361556 A   EP 0901000 A
EP 0776097 A   US 20020095288 A

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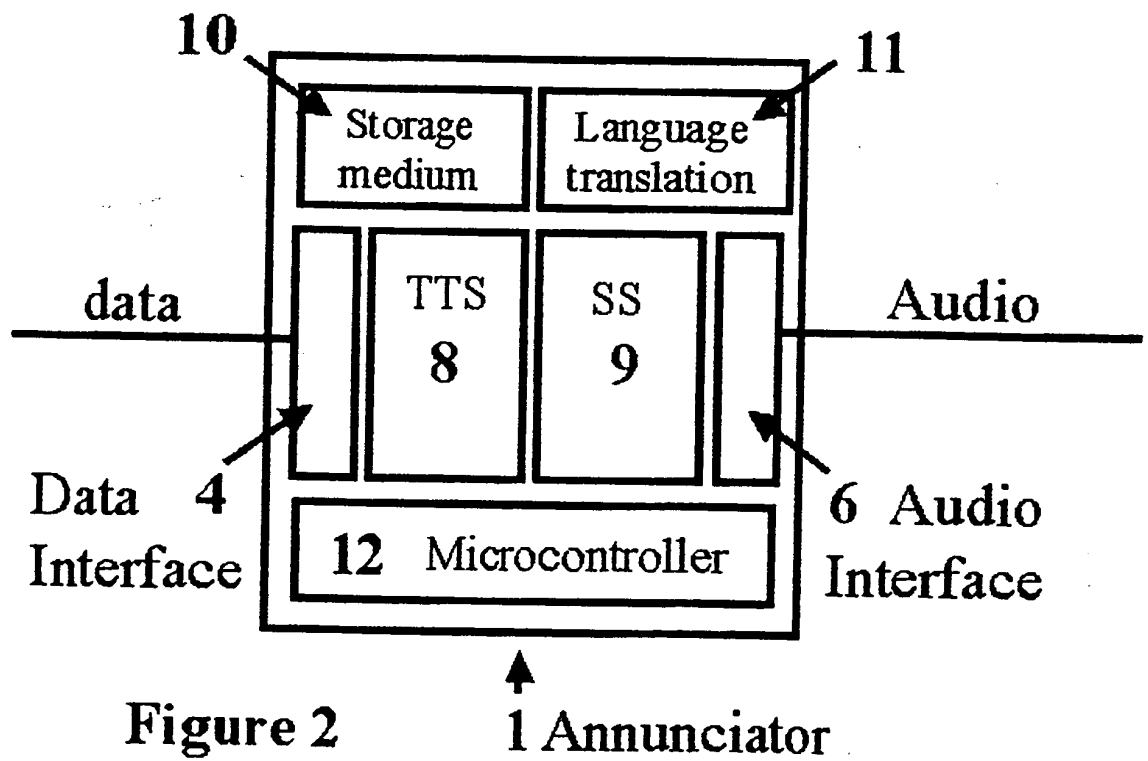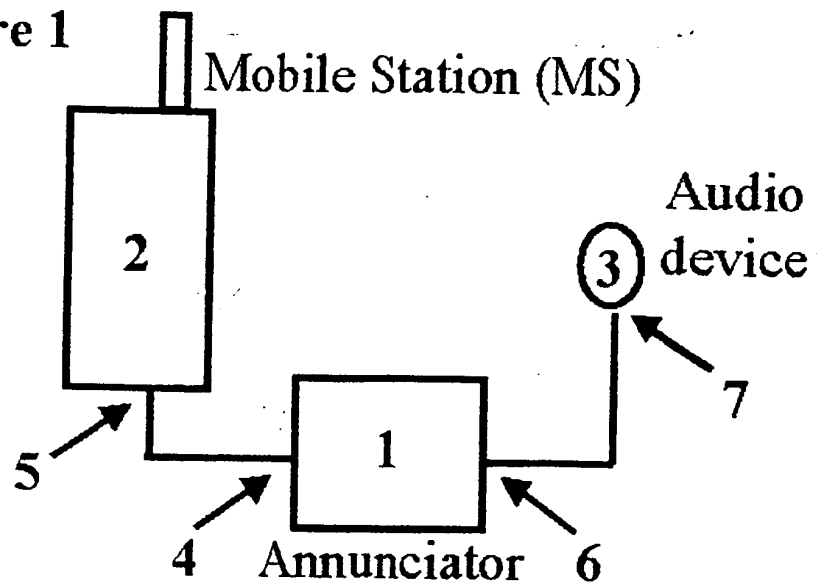INT CL⁷ G10L, H04M
Other: online: EPODOC,WPI,JAPIO

(54) Abstract Title
Annunciator for converting text messages to speech

(57) An Annunciator 1 is a portable device that includes Text-to-Speech and Speech Synthesis modules, which is connected (Fig 1) to a mobile station (MS) 2 and an audio device (AD) 3. The Annunciator can read ASCII messages (that are in a defined format such as GSM 07.07) received at the MS (these include short message service (SMS) messages) and convert them to speech. The Annunciator can therefore allow the user to listen, via an audio device, to the ASCII messages being read. This may be carried out independently of any received encoding schemes set in the message header. The speech output is possible in SMS peer-to-peer service or in SMS cell broadcast service. The Annunciator, an external to the MS device, may include the audio device, a microcontroller and wireless interface connections to the MS and AD. It may also include a storage medium and an on-the-fly language translation module.

Figure 1

Mobile Station (MS)

Audio device

Annunciator
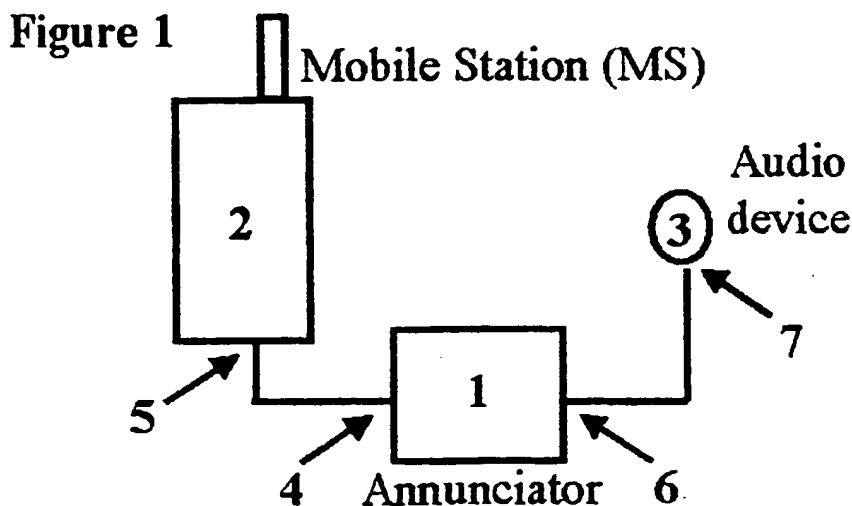
At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

This print takes account of replacement documents submitted after the date of filing to enable the application to comply with the formal requirements of the Patents Rules 1995

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Figure 1

Mobile Station (MS)

Audio
③ device

2

7

5

4 Annunciator 6

1

10

11

Storage
medium

Language
translation

data

TTS
8

SS
9

Audio

Data   4
Interface

12 Microcontroller

6 Audio
Interface

Figure 2   **1** Annunciator

The Annunciator

This invention relates to a portable device (i.e. that may be put anywhere convenient) that includes Text-To-Speech and speech synthesis support, which can be connected to a mobile station (MS) and an audio device (AD).

To receive ASCII text messages (including SMS) at an MS are well known, but suffer from the disadvantage that they can only be read (i.e. seen on a screen). In some circumstances, for example driving a car, it is difficult to read the received messages as soon as they have arrived and if the user is visually impaired then it is also impossible.

The objective of this invention is to allow messages that have been received at the MS to be read and converted to speech.

Accordingly, this invention uses Text-to-Speech and Speech Synthesis to listen, via an audio device (AD), to messages being read that have been received at a mobile station (MS).

Preferably the Annunciator is made of lightweight metal and/or plastics material and is as small as desirable in size to be used as a handsfree device.

A preferred embodiment of the invention will now be described with reference to the accompanying drawings in which:

Figure 1 shows how the Annunciator will be connected to the MS and AD.

Figure 2 shows a modular diagram of the Annunciator components.

As depicted in Figure 1, the Annunciator can be connected to a Mobile Station (MS) and an Audio Device (AD). The Annunciator (1) comprises of at least two I/O Interfaces 4 and 6. Data Interface 4 is used to transfer data to and from data interface 5 of the MS (2). Audio Interface 6 is used to transfer data to an AD (3) via its input interface 7. The physical connections between 4 & 5 and 6 & 7 respectively may be either cable or wireless.

As shown in Figure 2, the Annunciator consists, but is not restricted to, a number of interconnected modules. Each of these modules (4,6,8,9,10,11 and 12) may be either hardware (e.g. a chipset) or software (e.g. a program) or a combination of both. These modules may also be combined in any combination, for example modules 8 and 9 may be combined into a single chipset.

The Data Interface (4) has at least 3 uses; firstly to connect the Annunciator to at least one MS, secondly, to convert any data received into a format that can be used by the Annunciator and thirdly, to convert any data to be sent to the MS into a format that can be used by the MS.

The Text-To-Speech (TTS) module (8) and the Speech Synthesis (SS) module (9) collectively take as input an ASCII string and produce the corresponding audio output in a defined format.

The Audio Interface (6) has 3 uses; firstly to connect the Annunciator to at least one AD, secondly, to convert any data to be sent to the AD into a format that can be used by the AD and thirdly to adjust any customizable audio parameters which includes volume, tine, pitch, speed and articulation.

To facilitate flexibility the Annunciator may also include a storage medium (10), a language translation module (11) to multi-lingual speech and translation and a microcontroller (12).

Designed originally for the visually impaired, elderly and the handicapped but equally applicable in any handsfree environment an example of the "Annunciator" is one that uses the latest *Text-To-Speech* and *speech synthesis* technology to allow the user to listen, via a handsfree earpiece, to their SMS messages being read as they are received at their GSM mobile handset (900/1800/1900 Mhz). The Annunciator could support a fully programmable exception dictionary, multi-lingual pronunciation, and predefined voices with customizable parameters including volume, tone, pitch, speed, reverb, expression, formant frequency and articulation. The Annunciator with a programmable *word association dictionary* could also support user-defined SMS encoding and message shorthand, for example an SMS from +447703235307 with the text "WLC 2 TE ANCTR HNDFR SMS RDR" could be pronounced in English as "SMS received from VMWS: Welcome to the Annunciator handsfree SMS reader".

CLAIMS

1. An Annunciator includes a Text-to-Speech and Speech Synthesis module, which are connected to a mobile station (MS) and an audio device (AD).

2. An Annunciator as claimed in claim 1 where the Text-to-Speech and Speech Synthesis module are either combined hardware components or separate hardware components.

3. An Annunciator as claimed in claim 1 where the Text-to-Speech and Speech Synthesis module are either combined software components or separate software components.

4. An Annunciator as claimed in claim 1 where the Text-to-Speech and Speech Synthesis module is a combination of claim 2 and claim 3.

5. An Annunciator as claimed in any preceding claim including a wireless interface between the Annunciator and the MS.

6. An Annunciator as claimed in any preceding claim including a wireless interface between the Annunciator and the audio device.

7. An Annunciator as claimed in any preceding claim including an audio device.

8. An Annunciator as claimed in any preceding claim including a storage medium.

9. An Annunciator as claimed in any preceding claim including a language translation module.

10. An Annunciator as claimed in any preceding claim including a mircocontroller.

11. An Annunciator substantially as herein described and illustrated in the accompanying drawings.

| Application No: | GB 0110891.9 | 4 | Examiner: | Martyn Dixon |
| Claims searched: | all | | Date of search: | 10 December 2002 |

Patents Act 1977 : Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance	
X,E	1-5,7,8,10	GB 2361556 A	(Roundpoint) see e.g. page 9, lines 15-20, page 30, lines 16-22 and page 32, lines 12-22
X	1-5,7,8,10	EP 0901000 A	(Toyota) see e.g. figs 1 and 4
X	1-5,7,8,10	EP 0776097 A	(Wireless Links International) see e.g. abstract
X,E	1-4,7-10	US 2002/0095288 A	(Sparre *et al*) see e.g. abstract

Categories:

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^T:

H4R; H4L

Worldwide search of patent documents classified in the following areas of the IPC[7]:

G10L; H04M

The following online and other databases have been used in the preparation of this search report:

WPI,JAPIO,EPODOC

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